

Umetco Minerals Corporation

INTERNAL
CORRESPONDENCE



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To (Name) Mr. D. G. Millenbruch
Umetco Minerals Corporation
Division Danbury, CT

Date April 15, 1986

Originating Dept TECHNOLOGY

Location

Area

Area

Answering Letter Date

Copy to

Messrs

R. G. Beverly/R Jones

L. G. Evans

T. J. Kagetsu

F. V. McMillen

W. D. Smith

Subject Niagara Plant Radioactive
Material License 950-0139

APR 17 1986

The purpose of this letter is to bring you up-to-date on four areas within the Niagara Plant that were found to have levels of radioactivity well above background.

For your convenience, I am appending my letter of March 25, 1986 to Mr. R. F. Kelly of the New York State Department of Labor which identifies the four areas and outlines a plan for decontamination.

Subsequently it became obvious that the magnitude of the task was far greater than originally assumed.

In cleaning up the area around No. 30 furnace we filled seventeen 55-gallon drums. We had Mr. William Smith, Radiation Officer for Linde, and acting radiation officer for the Niagara Plant take samples and check them for alpha and alpha beta gamma radiation in his lab at Tonawanda. The activity suggested the cleanup was not complete.

The radiation in Building 24 (V-A1) came from a 9'6" x 10' concrete pit that was filled with a black sand that we later identified as primarily illmenite. This pit seemed endless; we discontinued the operation after removing one hundred twenty six 55-gallon drums and reaching a depth of 9 feet. In addition, the pit was found to extend beneath the floor of the V-A1 operation. ?

The third area, which we assumed was contaminated soil beneath a slag pile, turned out to be radiation from the slag itself. The amount of radioactive slag is small in comparison to the thousands of tons piled in the yard and fortunately is confined to a small area. So far we have not determined just how much slag we are talking about but I suspect it is not more than 100 tons. Even this amount presents problems in packaging for disposal.

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The extent of the contamination in Area 4 which is on L-Tec leased property is unknown at this time. The gamma radiation increases from 200 $\mu\text{R/hr}$ at the surface to about 600 $\mu\text{R/hr}$ at a depth of one foot.

To help in the assessment of our problem, ten (10) samples were submitted to EDA Laboratories in Colorado for radium, uranium and thorium analyses. The sample identification and results are reported in the attached Table 1. Before commenting on the analyses, I draw your attention to the State of New York, Department of Labor, Industrial Code Rule 38 that specifies what is required to terminate a license. Section 38.11, 38.29, Table 5 and Table 2 which pertain to this are reproduced and included as Appendix One.

Briefly, to terminate a license the Commissioner of the Department of Labor has to be notified; all radioactive material must be shipped to an approved recipient; the premises must be decontaminated and surveyed to show decontamination took place; and the survey must be verified by the State. Source material (uranium and thorium) must be reduced to 0.05 percent by weight to meet decontamination. (This is 500 ppm or 500 $\mu\text{g/g}$) For non-source material for which we are not licensed, the levels are specific for each element e.g. for radium the exempt concentration is 0.1 pico currie per gram.

Returning to Table 1, it can be seen that none of the samples exceed 500 ppm of uranium (results reported in $\mu\text{g/g}$). 500 ppm of Thorium 232 would have an activity of 55 pCi/g (or each pCi represents about 9ppm). Thus it can be seen there are several samples that contain thorium in excess of that required for decontamination. Looking at samples from each of the areas:

L-Tec, Samples 40-1, 40-2

The sample taken at one foot depth is out of compliance. We have made no attempt to determine the amount of soil that is contaminated.

Slag Pile East of No. 6 Furnace Room, Samples 40-3, 40-4

The Thorium 230 which is in the Uranium 238 decay chain is very high and obviously not in equilibrium with uranium or Radium 226. The Laboratory also found peaks in their analyses that suggest the presence of Thorium 229 (does not occur naturally). This suggests to me that some radioactive material may have been unknowingly introduced into one or more of the vanadium furnace heats and all or part ended up in the slag. This falls into the category of non-licensed material and possibly we need a ruling on it.

Furnace No. 30, Samples 40-5, 41-1, 41-2, 41-3

Sample 40-5 is a sample of slag taken from the south of Furnace 30 before we attempted to clean the area. As we suspected it was high in thorium which was present in the pyrochlor ores used in this furnace to make nickel columbium and ferro-columbium.

Sample 41-1 tells us we have more cleanup to do around the north furnace support. This is a difficult job because access to the support is restricted and also because the slag has penetrated between some of the brick supports.

TABLE 1
RADIOCHEMICAL ANALYSES OF SAMPLES FROM THE NIAGARA PLANT

BY: EDA LABORATORIES - WHEATRIDGE, COLORADO

APRIL 10, 1986

Sample No.	Description	ANALYSES					
		Ra 226	Uranium	Thorium			
		pCi/g	µg/g	232	230	228	(229)*
				pCi/g	pCi/g	pCi/g	(pCi/g)
2446-40-1	Surface Sample - L-Tec Property	14±2	34.7	36±3	15±2	38±3	
2446-40-2	Sample for 1' Deep - L-Tec Property	33±3	33.8	74±4	25±2	74±4	
2446-40-3	Dark Slag - East of No. 6 Furnace Building	4.4±1.1	20.2	16±2	299±7	4.0±.9	17±2
2446-40-4	Light Slag - East of No. 6 Furnace Building	7.0±1.4	18.6	37±3	466±9	14±2	40±3
2446-40-5	Slag Before Digging - South of No. 30 Furnace	550±10	389	241±7	186±6	241±7	
2446-40-6	Sample from Top of Pit - Building No. 24, V-A1	19±2	28 9	16±2	12±2	17±2	
2446-40-7	Sample from Approximate 5' Depth - Building No. 24, V-A1	31±3	44.3	37±3	22±2	39±3	
2446-41-1	Sample from North Furnace Support - Furnace No. 30 After Cleanup	180±10	122	139±5	76±4	145±5	
2446-41-2	Sample from Ground in Front of Furnace No. 30 After Cleanup	42±3	68.4	35±3	19±2	35±3	
2446-41-3	Sample from Southwest Area of Furnace No. 30 After Cleanup	43±3	24 9	9.6±1.3 8.5±1.3	6.2±1.1 5.9±1.0	9.5±1.3 9.2±1.3**	

*Th229 (not positively identified)

**Duplicate Analyses

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Samples 41-2 and 41-3 indicate the soil to the front and rear of the furnace contains less than 500 ppm combined uranium and thorium and as such meets requirements for uncontrolled access.

Pit in Building No. 24 (V-A1), Samples 40-6, 40-7

The material removed from the pit in Building 24 analyses less than 500 ppm combined uranium and thorium. However gamma radiation next to a drum will read 150 μ R/hr. I believe we will need a ruling on whether we have to dispose of it in an authorized repository or can leave it in the yard. The pit is still not completely clean with radiation of about 50 μ R/hr above the pit and about 150 μ R/hr. at the surface 9 feet down. Background is about 9 μ R/hr.

> how low
- below avg -

I have made the assumption that Radium 226, a decay product of Uranium 238, is at levels consistent with the uranium present and would not be out of line with the 500 ppm source material allowed by New York State. Lee Evans does not agree with me and suspects the state will retreat to the NRC guidelines for unrestricted use. I have mailed Bob Beverly as copy of the New York State Industrial Code Rule 38 for his interpretation.

We are faced with the decision on how to proceed (1) Umetco could elect not to proceed with license termination but then would be responsible for periodic license renewal, inspections, proof of financial responsibility, etc. and would be unable to sell the property, (2) Umetco could apply to have the license amended so that the area leased to Elkem, hopefully satisfactorily decontaminated, could be excluded from the license, or (3) Umetco could decide to push for license termination. If the third option is selected we will have to better define the problem and spell out the decontamination procedure in far more detail than in my letter of March 25, 1986 to R. F. Kelly.

Hopefully we can tackle this on your planned visit next week.

Sincerely,



D. J. Hansen

mau/357h
Attachments

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